

Ark., Cal., Ill., Ky., Mo., Nev. 25th, Cal., Conn., Ind., Ky., Ohio., Pa., Tenn. 26th, N. C., N. Y., Pa. 28th, Ala., Miss., R. I.

## SLEET.

Description of the more severe sleet storms of the month is given under "Local storms." Sleet was reported as follows: 1st, Ill., Me., N. Y., Pa. 2d, Ill., Ind., Iowa, Mass., Mo., Pa. 3d, Ill., Me., N. Y., Ohio, Pa., Vt. 6th, Ark., Mass., Nev., N. J., N. Y., Pa., R. I. 7th, Conn., Kans., Mass., Nev., N. J., Ohio, Oregon, Pa. 8th, Iowa, Kans., Mo. 9th, Ark., Ill., Ind., Ky., La., Mich., Miss., Mo., N. Y., N. C., Ohio, Pa., Tenn., Vt. 10th, Me., N. Y., Vt., Wash. 11th, Wash. 12th, Kans., N. J., Pa., Va., Wash. 13th, N. J. 14th, Oregon. 15th, Colo.,

Utah. 16th, Colo., Iowa, Mo., N. J., Va., Wis. 17th, Colo., Ill., Iowa, Ky., Mich., N. J., N. Y., Utah. 18th, Ill., Ind., Iowa, Kans., Ky., Mo., Pa., R. I., Wis. 19th, Colo., Ill., Ind., Iowa, Kans., Ky., Md., Mich., Minn., Mo., Nebr., Ohio., Pa., S. Dak., Tex., Va., Wash. 20th, Conn., Ill., Iowa, Mass., Mich., Nebr., N. J., N. Y., Ohio, Oregon, Pa., Vt., Va., Wash., W. Va., Wis. 21st, Nebr., Pa., Vt. 22d, Colo., Oregon, Utah. 23d, Colo., Ill., Nev., N. Mex., Oregon, Utah, Wash. 24th, Ariz., Cal., Colo., Ill., Iowa, Kans., Minn., Nev., S. Dak., Wis. 25th, Colo., Mo., Wis. 26th, Ark., Conn., La., Md., Mass., Miss., N. J., N. C., Pa., Va. 27th, R. I., Utah, Va. 28th, Colo., Ill., Ky., Miss., Oregon, Tenn., Utah.

## WINDS.

The prevailing winds during February, 1891, are shown on Chart II by arrows flying with the wind. In New England, the Lake region, the upper Mississippi and Missouri valleys, and over the southern and middle plateau regions the winds were generally from southwest to northwest; in the middle Atlantic states, from the northwest; in Florida and the west Gulf states, from northeast to southeast; in the east Gulf states, the Rio Grande Valley, and on the north Pacific coast, from east to south; in the Ohio Valley, from south to west; in the extreme northwest, from northwest to north; on the northeast slope of the Rocky Mountains, over the northern plateau region, and on the middle Pacific coast, from southeast to southwest; on the southeast slope of the Rocky Mountains, from west to north; on the south Pacific coast, from west to northwest; and in the south Atlantic states, Tennessee, and on the middle-eastern slope of the Rocky Mountains, variable.

## HIGH WINDS (in miles per hour).

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Signal Service, as follows: 4th, 56, nw., at Wood's Holl, Mass. 7th, 55, e., at Block Island, R. I.; 65, n., at Fort McKinney, Wyo. 8th, 54, nw., at Valentine, Nebr.; 52, nw., at Fort Sully, S. Dak. 9th, 50, se., at Fort Canby, Wash. 12th, 60, sw., at Fort Canby, Wash. 13th, 52, se., at Red Bluff, Cal. 14th, 52, sw., at Winnemucca, Nev. 15th, 50, sw., at Chicago, Ill. 16th, 56, w., at Winnemucca, Nev. 20th, 52, s., at Lexington, Ky. 22d, 50, s., at Winnemucca, Nev.; 50, nw., at Kitty Hawk, N. C. 23d, 52, sw., at Chicago, Ill.; 58, sw., at Winnemucca, Nev. 24th, 50, sw., at Abilene, Tex.; 52, sw., at Winnemucca, Nev.; 53, se., at Lexington, Ky.; 60, sw., at Chicago, Ill. 25th, 52, w., at Chicago, Ill.; 52, n., at Abilene, Tex. 26th, 56, w., at Jacksonville, Fla. 28th, 50, s., at Winnemucca, Nev.

## LOCAL STORMS.

**7th.**—A severe sleet and snow storm caused great damage to electric wires in east-central, central, and south-central New York.

**8th.**—A heavy storm of wind and snow prevailed over Nebraska, west Iowa, South Dakota, and Minnesota, delaying railroad trains, and causing loss of life in Nebraska and South Dakota. At Valentine, Nebr., the storm was reported as one of the severest ever noted at that station. North and northwest winds of 30 to 52 miles per hour continued all day, and the snow drifted 4 to 10 feet deep. A soldier and 2 settlers were reported frozen to death 6 miles from the station. At North Platte, Nebr., the wind attained an extreme velocity of 60 miles. At Genoa, Nebr., the snow drifted 10 to 12 feet deep in places. At Elkton, S. Dak., a gale from the ne. reached about 80 miles per hour; 6 persons were lost in the storm and frozen to death. High north winds prevailed in San Bernardino county, Cal., causing considerable damage. The walls of the new sugar refinery at Chino were blown down, and many oranges were whipped from the trees by the wind. High northerly winds prevailed in the Santa Ana Valley, and

sand storms were reported in the Mojave and Colorado deserts. A sloop was wrecked off Catalina Island and 2 men lost.

**9th.**—At 3.30 p. m., central time, a tornado, moving n. 65° e., passed over Helena, Ala., damaging 10 buildings to the extent of about \$5,000. Heavy rain and heavy thunder prevailed before and light rain followed the passage of the storm. A whirling motion from right to left was observed; a roaring sound was heard, and articles were carried up. The path of greatest destruction was about 150 feet in width and about 2 miles in length. A severe storm was also reported at Talladega, Ala. At 3 p. m., central time, a storm moved northeast over Coaling, Ala., with thunder and lightning and heavy rain after its passage. A loud roaring sound was heard; the storm apparently revolved slowly from right to left and light articles were carried up. The width of the path of greatest destruction was about 500 yards. Timber in the centre of the path was generally prostrated in the direction the storm moved, although some trees were thrown outward. No persons were killed, but a number were injured. Several small buildings, valued at a few thousand dollars, were destroyed, and others were injured. The destruction of timber was very great. At Chattanooga, Tenn., heavy rain fell at intervals, flooding sewers. The rush of water into the artificial lake at the Electric Park, near the foot of Missionary Ridge, caused the embankment to give way, flooding the surrounding country. Railroads were seriously affected by washouts and landslides. At Bryson City, N. C., telegraphic communication was cut off and a bridge was carried away during a storm.

**11th.**—A severe wind storm, with thunder and rain, caused some damage to timber south of Soapstone Mount, N. C.

**12th.**—An unusually heavy storm visited Puget Sound at night, delaying boats.

**13-14-15th.**—A rain storm prevailed over north California and west Oregon on the 13th and 14th, swelling streams and causing washouts and landslides. At Red Bluff, Cal., the rain continued until midnight of the 15th, with a southeast gale. The abutments of 2 bridges were damaged, also the electric light plant. From midnight of the 14th to 7.05 a. m. of the 16th 6.07 inches of rain fell at Red Bluff, the greatest amount of precipitation noted for one storm in three years. The rainfall was also heavy in other parts of the state, and was of great benefit to the fruit crop.

**16th.**—A thunder-storm, with a shower of hail about the size of peas, occurred at Eureka, Cal., at 10 p. m., damaging electric wires. A severe wind storm was reported in Calaveras county, Cal.

**17th.**—High northwest winds and heavy snow prevailed in Minnesota. The snow drifted badly, delaying trains. A high e. wind, blowing 50 miles per hour, prostrated some timber at Lunenburg Vt.

**18-19th.**—A severe rain, sleet, and snow storm prevailed from Colorado to Indiana, prostrating electric wires. At Leavenworth, Kans., the damage to wires was estimated at \$3,000.

**20th.**—At Grand Haven, Mich., snow turned to rain which

froze as it fell. Telegraph wires were prostrated and communication was cut off. At San Antonio, Tex., heavy rain, with thunder, began at 7.45 a. m. Hail the size of chestnuts fell, breaking window glass. A severe storm moving north-east was reported at Cape Girardeau, Mo., in the morning.

**21st-24th.**—Heavy rain and gales prevailed on the Pacific coast, causing an immense amount of damage. A description of the floods resulting from the rainfall will be found under the heading "Floods." At San Francisco, Cal., rain began 10.30 a. m., 21st, and continued at intervals during the 22d. During this period the wind blew a gale, reaching a velocity of 50 miles per hour the night of the 22d, when the Signal Office anemometer cups were blown away. The ship "Elizabeth" was wrecked about 4 miles outside the Golden Gate, near Rocky Point, the evening of the 21st. The ship went to pieces soon after striking the rocks, and 18 of the 29 persons on board were drowned. The life-saving crews and tug tried to save the ship and the persons on board, but owing to high wind little or nothing could be done. The captain of the life-saving crew was drowned. Much damage was done about the city and harbor by high wind. Some new and unfinished buildings were blown down, several barges were sunk, and telephone and telegraphic communication was almost entirely suspended. At Sacramento, Cal., high south winds prevailed on the 22d, and the barometer fell to 29.10, the lowest ever noted at that place. At Eureka, Cal., the barometer stood at 29.06 at 10 p. m. of the 21st, with wind blowing a gale from the southeast. At 8 p. m. of the 22d the barometer fell to 28.97, the lowest ever recorded at that place. At Roseburgh, Oregon, rain and heavy, moist snow alternated during the 22d, prostrating electric wires, and on the 24th rain fell at intervals, and washouts were reported on railroads to the southward. On the 23d, between 1 and 2 a. m., a heavy wind and hail storm at Berkeley, Cal., uprooted trees and stripped them of their branches. At San Diego, Cal., rain began in the early morning of the 22d and continued all day, with steady south to southeast wind. Heavy rain continued nearly all night of the 22-23d. On the 24th a heavy shower of rain fell in the afternoon. At Red Bluff, Cal., a southeast gale, with rain, prevailed from midnight to 3.30 a. m. of the 23d. At Olympia, Wash., light snow fell on the 23d, and the barometer fell to 29.00, the lowest since 1880. At Winnemucca, Nev., a south gale began 1.15 a. m., 23d, with maximum velocity 40 miles per hour. Rain began 4.45 a. m., and changed to moist snow, which ended 10.15 a. m. The gale ended 6.30 a. m. A second gale began shortly after noon, with sleet and snow squalls, and maximum wind velocity 58 miles per hour from the sw. The storm ended 11 p. m. Sheds were blown down and panes of glass blown in. At Keeler, Cal., high s. winds prevailed on the 23d, with rain in the morning. At 8 a. m. the barometer read 29.15, the lowest recorded at the station. Disastrous floods prevailed in west Arizona from the 22d to the close of the month. At Farley's Camp, Ariz., 4.00 inches of rain were reported in 9 hours on the 23d. A report from Cottonwood, Ariz., dated the 23d, stated that it had rained steadily for 6 days at that place. At Los Angeles, Cal., the barometer fell during the night of the 22-23d, with brisk s. to se. winds and rain, which fell heavily at times. At 8 a. m., 23d, the barometer read 29.50, corrected, the lowest reading recorded during a winter storm; the lowest barometer previously recorded being 29.52 during the great storm of February, 1884. An immense amount of damage was caused in that region by floods and freshets.

**22d.**—A storm, with thunder and lightning, moved ne. over Sunbury, N. C., at 10.30 a. m., eastern time, killing one child and doing about \$4,000 damage to property.

**24th.**—At 4.45 p. m., central time, a tornado moved north-east over Troy, Mo., and traveled about 6 miles in a direct line. Path of greatest destruction about 200 yards in width. Damage to buildings \$2,000 to \$2,500. Light rain fell just before the passage of the storm. The main part of the funnel seemed to be about one-half mile high, with a long, kite-like tail which hung down towards the earth. At West Bend, Iowa, a thunder-storm began about 6 a. m., and at 9 a. m. the wind changed to nw. and blew hard all day. The temperature fell 40° in 24 hours. At Manson, Iowa, high temperature and thunder and lightning prevailed in the early morning. The wind suddenly veered to w. and nw., reaching 35 to 40 miles per hour, with light snow, and the temperature fell 46° in 8 hours. At Amana, Iowa, the temperature was very high in the morning; at 2 p. m. the wind veered to w., and in 6 hours the temperature fell 31°, with wind blowing hard from the nw. At midnight a tornado moving e. was reported at Utica, Ind. The storm had a whirling motion from s. to e. and was attended by a continuous glare of lightning. Timber and other articles were carried up. All trees blown down were lying in an easterly direction, and some trees had the tops torn off. The path of greatest destruction was about 100 feet in width and passed through the centre of the town, where buildings were damaged to the extent of about \$6,000. Large timber was carried up by the storm and driven through the sides of houses. At Jeffersonville, Ind., a bell tower and a few trees were blown down in the eastern part of the city. About midnight, central time, a storm passed ne. over Newcastle, Ky., with very heavy thunder, lightning, small hail, and heavy rainfall following. A roaring sound was heard, and timbers were carried some distance. The path of heaviest wind was about 50 yards in width; buildings were damaged to the extent of about \$2,000. At Louisville, Ky., a heavy thunder-storm occurred the night of the 24-25th, with heavy rain and violent winds, the highest velocity, 40 miles per hour, occurring shortly after midnight. Much damage was caused to chimneys, etc.

**25th.**—A dust storm prevailed at Abilene, Tex., in the afternoon. The wind shifted to n., and reached 52 miles per hour. The instrument shelter of the Signal Office was carried away, some outhouses blown down, and other damage caused.

**26th.**—At Cape Henry, Va., a severe gale prevailed, with maximum velocity 54 miles per hour from the nw. at 5.22 p. m. Rain, with snow squalls, occurred in the evening. All vessels were compelled to seek shelter in Hampton Roads. At Jacksonville, Fla., a w. gale prevailed, with light rain in the morning. The wind reached a velocity of 56 miles per hour at 3.50 p. m. This velocity has been exceeded but once at that station, in March, 1872, when the wind reached 58 miles per hour from the ne. A number of houses and electric wires were damaged.

**28th.**—A heavy thunder-storm, with rain changing into snow, prevailed over southeast Massachusetts. At Wellfleet a church was struck by lightning and burned. At Truro the signal station was struck by lightning and set on fire. At Cape Cod Light station articles in the dwelling were torn to pieces and the keeper's wife was stunned. At New Bedford a heavy wind, thunder, rain, and snow storm occurred in the evening. At Smith's Neck, Misham Point, South Dartmouth, Martha's Vineyard, and on Elizabeth Islands, and at other points, buildings were struck by lightning and burned.

## INLAND NAVIGATION.

### FLOODS.

On the 2d the Ohio River was rising rapidly at Cincinnati, Ohio, and Louisville, Ky. At Cincinnati the river was 38.9 feet on the gauge at 7 a. m., a rise of 13.9 feet in 48 hours.

This almost unprecedented rise was due to sudden outpours from the Little Miami and Licking rivers. During the day the river rose at the rate of 0.2 foot per hour. At Louisville the water was 16.6 feet in the canal at 5 p. m. On the 3d the